Name: Date:

Polynomial Factoring solution (version 23)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 10x + 33 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(10) \pm \sqrt{(10)^2 - 4(1)(33)}}{2(1)}$$

$$x = \frac{-(10) \pm \sqrt{100 - 132}}{2(1)}$$

$$x = \frac{-10 \pm \sqrt{-32}}{2}$$

$$x = \frac{-10 \pm \sqrt{-16 \cdot 2}}{2}$$

$$x = \frac{-10 \pm 4\sqrt{2}\, i}{2}$$

$$x = -5 \pm 2\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-8 + 6i$ and $2 - 5i$ in standard form $(a + bi)$.**

Solution

$$(-8 + 6i) \cdot (2 - 5i)$$

$$-16 + 40i + 12i - 30i^2$$

$$-16 + 40i + 12i + 30$$

$$-16 + 30 + 40i + 12i$$

$$14 + 52i$$

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3. **Write function $f(x) = x^3 - 8x^2 + 11x + 20$ in factored form. I'll give you a hint: one factor is $(x + 1)$.**

Solution

	1	-8	11	20
-1		-1	9	-20
	1	-9	20	0

$$f(x) = (x+1)(x^2 - 9x + 20)$$

$$f(x) = (x+1)(x-4)(x-5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+2)^2 \cdot (x-2) \cdot (x-6)^2$$

Sketch a graph of polynomial $y = p(x)$.